5.12 Noise

This section summarizes the impacts due to noise from implementing either the Proposed Program or any of the Alternatives.

5.12.1 Significance Criteria

As Section 4.12 notes, the California Code of Regulations (CCR), section 65302(f) requires that Counties contain a noise element in their General Plans. In addition, California Department of Health Services (1987) has developed noise guidelines for noise elements in local General Plans. The State guidelines also recommend that local jurisdictions consider adopting local nuisance noise control ordinances. Because CAL FIRE is the proponent and lead agency for this project, compliance with local standards is not required. However, the State considers local noise standards as they relate to the compatibility between the Program and various land uses adjacent to project sites. Thus, local noise standards are used as guidelines for what the CAL FIRE considers as acceptable noise levels in noise-sensitive areas.

Noise impacts would be considered significant if the Program and the Alternatives would cause:

a) Exposure of persons to, or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
b) Exposure of persons to, or generation of, excessive ground-borne vibration or ground-borne noise levels;
c) Substantial permanent increase in ambient noise levels in the project vicinity (above levels existing without the project);
d) Substantial temporary increase in ambient noise levels in the project vicinity (above levels existing without the project).

5.12.2 Determination Threshold

The Program and Alternatives are considered to create a significant effect when a treatment or treatments creates:

a) Noise in excess of 90 dBA* at 50', or in excess of 65 dBA at 1,600 feet at sensitive receptor locations (schools, residential units, churches, libraries, commercial lodging facilities, and hospitals or care facilities).

b) Noise levels in excess of 70 dBA L_{dn}*

c) The Program and Alternatives are considered to create moderately adverse effects when noise levels are between 60 and 70 dBA L_{dn}* (State Office of Noise Control 1976).

(*See definitions in Section 4.12.4 for a description of dBA and dBA L_{dn})

5.12.3 Data and Assumptions

Section 4.12 provides the context for describing the consequences to sensitive receptors from noise due to implementation of the Proposed Program and Alternatives. The Proposed Program potential treatment acreage by bioregion is described in Tables 5.0.1, 5.0.3, 5.0.4, 5.0.5 and 5.0.7. Total acreage treated over a ten-year period is projected to be approximately 2.16 million acres, which represents about 5.6% of the total acreage of CAL FIRE jurisdiction lands that might be treatable in any ten-year period. Annual acreage treated is expected to be about 216,910 acres.

Table 4.12.1 describes the dBA at 50 feet of various types of equipment and machinery, which would be used or is similar to equipment likely to be used in the Proposed Program. Table 4.12.2 describes the sound levels of various types of equipment measured at 150 feet from the equipment, which is expected to be very similar to noise levels from the mechanical equipment used to implement mechanical treatments. Table 4.12.2 also includes the sound levels from chainsaws measured at 250 feet. Additional dBA levels at 50 feet for other types of equipment are shown below in Table 5.12.1. Noise impacts from helicopters (used for ignition of prescribed fire) are based on FAA Advisory Circular-AC36-1G, Bell Series and Hughes models noise levels (CAL FIRE, 2005).

Table 5.12.1
Noise Levels of Equipment Likely to be Operated Under Proposed Program

Equipment	dBA at 50'		
Dozer	85-90		
Tractor	77-82		
Front End Loader	86-90		
Hydraulic backhoe	81-90		
Hydraulic excavator	81-91		
16 wheel Truck	81-87		
Chainsaw	90		
Mobile Chippers	115		
Helicopter	Flyover	Takeoff	Landing
	dBA at 150 meter	dBA at 50’	dBA at 50’
Bell 206 L-111	86.9	87.6	91.1
Bell 206 L-IV	83.3	84.1	87.3
Bell 206 B-III	85.2	88.4	90.7
Hughes 500 D	88.7	n/a	n/a

Duration of time for projects (Table 5.12.2) is based on estimates from ENSR International (ENSR International, 2005) for the BLM PER (USDI BLM, 2005).

Table 5.12.2
Production Rates and Associated Noise Levels For Equipment Used in Proposed Program

	Pro-duction	Rate	Days to Complete a Project	Equipment	dBA @ 50'	Assumptions
Mechanical mowing	50	ac/day	5.2	Tractor	80	BLM, plus 1 16-wheel lowbed for move in/out
Mechanical dozer blade and pile	6	ac/day	44.2	Dozer	87	BLM, plus 1 16-wheel lowbed for move in/out
Mechanical chaining (2 dozers)	11	ac/day	22.7	2 dozers	87	est., 2 dozers 500' apart at 2000'/day, also 2 16-wheel lowbed for move in/out
Mechanical excavator mastication	5	ac/day	52.0	excavator	85	est., plus one 16 wheel lowbed for move in/out
Road side chipping	7	Ac/day	39	Feller bunches, skidder and mobile 200-400 hp chipper	115	Remove 190 tpa 7" in diameter with feller buncher, skid to landing, chip and blow into chip vans
Hand pulling cutting, shoveling	1	ac/day	52.0	None	45	BLM 5-person crew clearing 5 acres/day
Hand cutting and hand clearing	1	ac/day	52.0	5 chainsaws	90	BLM 5-person crew clearing 5 acres/day
Herbicide backpack spray	1	ac/day	52.0	None	45	BLM 5-person crew spraying 5 acres/day
Herbicide ATV spray	10	ac/day	26.0	ATV	70	BLM, 10 acres/day
Prescribed fire hand ignition	260	ac/day	1.0	Pickup truck, fire engines	65	7 igniters, 1 command vehicle, 1 crew rig, 2 fire engines
Prescribed fire helitorch	260	ac/day	1.0	Helicopter	90	2 fire engines, command vehicle, helicopter, helicopter support trucks
Prescribed herbivory	10	ac/day	26.0	Pickup truck	65	1 person tending with 1 rt/day

5.12.4 Direct Effects Common to all Bioregions From Implementing the Program/Alternatives

Table 5.12.3 summarizes the information from the balance of this chapter from the noise created through implementing the Proposed Program across the state by bioregion.

Table 5.12.3
Summary of Noise Effects 1/ From Implementing the Proposed Program

Bioregion	Prescribed Fire	Mechanical	Hand	Herbicide	Herbivory
Klamath North Coast	NA	NA	NA	NA	NA
Modoc	NA	NA	NA	NA	NA
Sacramento Valley	NA	NA	NA	NA	NA
Sierra	MA	MA	MA	NA	NA
Bay Area	MA	MA	MA	NA	NA
San Joaquin	NA	NA	NA	NA	NA
Central Coast	MA	MA	MA	NA	NA
Mojave	NA	NA	NA	NA	NA
South Coast	MA	MA	MA	NA	NA
Colorado Desert	NA	NA	NA	NA	NA

1/ Key to effects; adverse effects are those effects which degrade the diversity, structure, size, integrity, abundance or number of; or are outside the natural range of variability, for the resource at issue. Beneficial effects are those effects that improve the diversity, structure, size, integrity, abundance or number of; or are within the natural range of variability, for the resource at issue. SA/SB – significant adverse effects are those effects that are substantial, highly noticeable, at the watershed scale; and often irreversible. MA/MB - moderately adverse or beneficial effects - those effects that can be detected beyond the affected area, but are transitory and usually reversible. NA/NB - negligible adverse or beneficial effects - those effects that are imperceptible or undetectable.

Effects to Human Health and Community Well-Being Due to Implementation of the Program

Noise is often defined as unwanted sound, and thus is a subjective reaction to characteristics of a physical phenomenon. In addition, noise impacts apply only if the noise is heard or felt. The vegetated nature and often high relief of the treatment areas can create an environment in which topographical features and vegetation dampen much of the noise. However, VTP treatments, particularly helicopter-assisted prescribed fire and most mechanical treatments, and hand treatments using chainsaws can present a source of significant temporary noise.

The human response to environmental noise is subjective and varies considerably from individual to individual. Noise in the community has often been cited as a health problem, not in terms of actual physiological damage, such as hearing impairment (though hearing loss can also occur at the highest noise intensity levels), but in terms of inhibiting general well-being and contributing to undue stress and annoyance. The health effects of noise arise from interference with human activities, including sleep, speech, recreation, and tasks demanding concentration or coordination. When noise interferes with human activities or contributes to stress, public annoyance with the noise source increases.

The vast majority of the noise generated from Proposed Program treatments will be located in relatively rural parts of the state where sensitive receptors such as hospitals, schools, libraries, churches, etc., are often miles from the treatment site. The exception is likely to be residences, particularly those in the WUI, where operations might take place immediately

adjacent to homes. Typically, operations immediately adjacent to structures would utilize hand equipment (e.g. chainsaws).

Noise can have a negative effect on people's recreational experience if operations are conducted on or near public lands such as near campgrounds and trails (e.g. State Parks, some federal lands such as USFS and USFWS forest and wildlife refuge lands). However, only about 10% of the nearly 38 million acres of jurisdiction lands are "public" lands open to the public. The vast majority of the jurisdiction acreage is composed of private land where private landowners themselves propose the treatments.

Disturbances associated with mechanical treatments would be substantial, though short in duration. Equipment associated with mechanical treatments can generate noise levels ranging from approximately 75 to 90 dBA at 50 feet, depending upon the equipment being used, although mobile chippers can reach sound levels of 115 dBA. Typical operating cycles may involve two minutes of full-power operation, followed by three or four minutes of operation at lower levels. In addition, treatment activities are carried out in stages, during which the character and magnitude of noise levels surrounding the treatment area changes as work progresses, as different equipment is used and the location of the noise-generating work moves throughout the treatment area.

Properly maintained equipment produces noise levels near the middle of the indicated ranges. Activities such as tractor piling, masticating, chipping, falling of small trees/shrubs with chainsaws, etc., are the most common noise generators. As a result, Proposed Program equipment and tools typically will generate noise levels of 70–90 dBA at a distance of 50 feet.

The sounds from heavy equipment are often dampened or attenuated by the surrounding vegetation and soft ground surface. This type of attenuation would not occur with helicopter treatments, since air does not attenuate sounds the same way the ground surface does. As a result, helicopter sounds can carry unobstructed for many miles because they often fly above the natural sound barriers.

Section 5.10 describes the likely number of vehicles used daily to carry workers to and from the treatment site that would also contribute to noise. Generally, the noise from vehicles carrying workers to treatment sites is likely to be less than the noise created by the treatments themselves.

The potential effects due to implementing the Program or Alternatives will be of short duration (<10 weeks per project on average) and limited to typical workday hours (~7AM to ~7PM). Most projects occur in remote areas, and while background noise levels are low, sensitive receptor sites such as schools, libraries, etc. are usually many miles distant. In addition, Table 5.0.7 indicates that for the Proposed Program, on an annual basis, 88% of watersheds within the program area will not receive any VTP treatments. For the 12% of watersheds that do receive treatments every year, 96% of them will receive three treatments or less, and most (74%) will only receive 1 treatment annually.

It is unlikely that a single residential or commercial area will be affected by the noise from more than one watershed treated annually. Even for a watershed where multiple treatments

occur within one year, the odds of all treatments occurring simultaneously are low. Therefore, at most and only in rare cases would the nearest residential or commercial area to a VTP-treated watershed be affected by 2 simultaneous projects.

Table 5.12.4
Number of Projects by Treatment Type for Proposed Program

	Prescribed Fire (helicopter)	Mechanical	Hand	Herbicides	Prescribed Herbivory
dBA Maximum Likely	90	90	90	70	65
Weeks/260 acre treatment	0.2	5-10	5-10	5-10	5
	Number of Projects Per Bioregion				
North Coast/Klamath	52	18	10	9	10
Modoc	46	15	9	8	9
Sacramento Valley	64	22	12	11	12
Sierra	87	30	16	15	17
Bay Area	32	11	6	5	6
San Joaquin	24	8	4	4	5
Central Coast	79	27	15	13	12
Mojave	4	1	1	1	1
South Coast	42	14	8	7	8
Colorado Desert	16	5	3	3	1
	446	151	84	76	81

The amount of noise associated with prescribed fire treatments above is based on all treatments being implemented via helicopter. In reality, many (50% or more) treatments would be implemented using hand ignition so that noise associated with prescribed fire will often be far less than estimated above.

Most treatments take place in rural areas. Of the ~820 projects that might be implemented per year, 372 (45%) of the projects will take place in rural bioregions such as the North Coast/Klamath, Modoc, Sacramento Valley, San Joaquin, Mojave and Colorado Desert.

Assuming that half of all prescribed fire treatments are conducted using hand ignition, about 380 of the ~820 projects conducted yearly would be conducted at noise levels of around 65-70 dBA while the balance of the projects would have periods during the day when sound levels could reach 90 dBA within 50 feet of the treatment equipment. About 440 projects would be implemented across approximately 38 million acres of jurisdiction lands where sound levels could reach 90 dBA at particular times between 7AM and 7PM, 5 days per week for periods as long as 10 weeks. However, as noted above, peak noise levels are rarely continuous over periods of more than two minutes at a time due to equipment maneuvering, chainsaw operators moving to the next piece, etc.

Operation of heavy equipment can generate ground-based vibration, particularly operations by dozers. Rubber-tired skidders, masticators, mowers, roller choppers, etc., usually do not develop the amount of ground based vibration that a 45,000 pound or larger (D7 or equivalent) dozer can. However, while dozer operations might take place within several

hundred feet of sensitive receptor locations, vibrations from such operations are expected to be short duration, consistent with the operational performance times noted above. In addition, only about 18% of annual treatments within any bioregion would be mechanical, and then, not all of those would use a dozer.

Effects to Human Health and Community Well-Being Due to Implementation of the Alternatives

The effect of implementing Alternative 3 is expected to be similar to the effects associated with implementing the Proposed Program. Treatment acreages and treatment types are similar and the major difference is on location of Alternative 3 treatments with respect to streams. The effect of implementing Alternative 2 would be to increase the overall noise generated by treatments compared to the Proposed Program, since herbicides would not be a treatment option and more treatments would be conducted using mechanical and hand methods, which typically have a higher noise output than herbicide treatments. Treatment under the Status Quo (Alternative 1) would not increase the amount of noise generated by treatments above that generated now. The location and number of days where noise is generated under the status quo is estimated to be one-fifth as much as the Proposed Program, because only about one-fifth as many acres are being treated annually. Alternative 4 would treat about 40% as many acres as the Proposed Program. However, very few of the treatments in Alternative 4 would utilize prescribed fire—a larger proportion employ mechanical and hand treatments, which generate more noise than prescribed fire treatments. Nonetheless, Alternative 4 would likely result in noise being produced on about half as many locations and days of Proposed Program.

5.12.5 Bioregion-Specific Direct Effects of Implementing the Program/ Alternatives

Treatments near sensitive receptors are more likely to occur in the Sierra, Bay Area, Central Coast and South Coast Bioregions than the other bioregions. Otherwise, noise effects in these bioregions are expected to be similar to the other bioregions. To the extent that prescribed fire using helicopters is applied more often in these bioregions, especially in the South Coast and Central Coast, there is a potential that somewhat less noise might be generated compared to the more rural bioregions, because, although helicopters generate more noise during operation than hand ignition and its associated noises, the duration of these projects (and thus total noise effects) is far shorter: It is common for an entire 260 acre project can be burned in one day using a helicopter compared to several days or more utilizing hand ignition.

5.12.6 Indirect Effects of Implementing the Program/Alternatives

There are potential indirect effects to human health and to wildlife associated with noise from the Proposed Program. Indirect effects to human health and to the health of wildlife arise in terms of inhibiting general well-being and contributing to undue stress and annoyance.

5.12.7 Determination of Significance

Implementation of the Proposed Program is not expected to create substantial adverse effects due to adoption of the mitigation measures specified below (5.12.9). Specifically:

a) Implementation of the Program could generate or expose persons at sensitive receptor sites to noise levels of 90 dBA at 50 feet or in excess of 65 dBA at 1,600, or 70 dBA L_{dn}, and therefore potentially create an adverse effect. However with adoption of the mitigation measures below, the effect is less than significant.

b) It is not possible to make a determination as to whether implementation of the Proposed Program would be in excess of standards established in the revised noise elements of County General Plans or applicable standards of other agencies because the specific location of Proposed Program treatments is not known. However, with adoption of Mitigation Measure 5.12-1, the potentially substantial adverse effects are expected to be less than significant.

c) Implementation of the Program will not generate or expose persons to excessive ground-borne vibration because the extent and intensity of such treatments is of short duration. As a result, the Proposed Program would not create a substantial adverse effect and the impacts are expected to be less than significant.

d) Because of the transitory nature of VTP projects, implementation of the Program will not result in a permanent increase in ambient noise levels above levels existing without the project, and therefore would not create a substantial adverse effect resulting in a less than significant impact to the environment.

e) Most of the Proposed Program treatments are far removed from sensitive receptor sites such as schools, churches, hospitals, and libraries. Noise associated with the Proposed Program will temporarily increase noise levels from project activities including production of noise levels of 90 dBA at 50 feet or in excess of 65 dBA at 1,600, or 70 dBA L_{dn}, and thus these effects could create substantial adverse effects. The severity of such impacts will be temporary and the effects are dependent on the number of individual projects that might occur simultaneously. Adoption of the mitigation measures below will reduce these potentially substantial adverse effects to less than significant.

5.12.8 Similar Effects Described Elsewhere

The effects of noise to wildlife are described in Section 5.5.

5.12.9 Mitigation Measures for the Proposed Project

The following mitigation measures will ensure that potentially substantial adverse effects do not occur.

Mitigation 5.12-1. The project proponent shall comply with noise standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

Mitigation 5.12-2. The project proponent shall limit periods of equipment operation to 7AM to 7PM if treatments are within 1,600 feet of sensitive receptors. The project proponent shall use site-specific measures that take into account the nature of the area and the inhabitants, or receptors.

Mitigation 5.12-3. The project proponent shall limit VTP operations within the vicinity of occupied campgrounds and picnic areas to weekdays and non-holidays between 7AM and 7PM. Noise abatement mitigation (e.g., limiting operations to weekdays, keeping heavy equipment as far away from receptors as feasible, and where necessary, utilizing methods and machinery that are less noisy) shall be included in any treatment that is within 100 feet of an open campground or within 200 feet of a residence, park, or other identified sensitive receptor.

Mitigation 5.12-4. The noise effects from treatment operations on wildlife shall be mitigated as necessary. Depending on the wildlife species present, its status may require a consultation with DFG staff, within the nesting/breeding areas of noise sensitive listed species on a site-specific basis during the critical reproductive and young-rearing months.